

SECTION 3

SAFETY AND HEALTH

3.1 Introduction

3.1.1 Collection and analysis of benthic samples involve significant risks to personal safety and health. While safety is often not considered an integral part of benthic sampling routine, the biologist must be aware of unsafe working conditions, hazards connected with the operation of sampling gear, and other risks. Management should assign health and safety responsibilities and establish a program for training in safety, accident reporting, and medical and first aid treatment. Written safety policies should be available to all persons involved in the sampling and analysis of macroinvertebrate samples and this should include a copy of the USEPA (1986) safety manual.

3.2 General Precautions

3.2.1 Basic good housekeeping practice should be followed both in the field and in the laboratory. These practices should be aimed at protecting the staff from physical injury, preventing or reducing exposure to hazardous or toxic substances, avoiding interferences with laboratory operations, and producing valid data.

3.2.2 Operation of benthic sampling devices involves hazards that must be addressed by the person using the equipment. Some grab samplers (e.g., Ekman, Smith-McIntyre) have spring loaded cocking devices that can cause serious injury if not handled and operated carefully. Other grabs (e.g., Ponar) have safety locking pins that must be put in place to prevent injury. Persons using these devices should become familiar with the hazards involved and establish appropriate safety practices prior to using them.

3.2.3 Field personnel should know how to swim. Waders should always be worn with a belt to prevent them from filling with water in case of a fall. A life jacket at dangerous wading stations is advisable if one is not a strong swimmer because of the possibility of sliding into deep holes.

3.2.4 Many hazards lie out of sight in the bottoms of lakes, rivers and streams. Broken glass or sharp pieces of metal embedded in the substrate can cause serious injury if care is not exercised when walking or working with the hands in such environments. Infectious agents and toxic substances that may be absorbed through the skin or inhaled may also be present in the water or sediment.

3.2.5 Personnel must consider and prepare for hazards associated with the operation of motor vehicles, boats, winches, tools, and other incidental equipment. Boat operators should be familiar with U.S. Coast Guard rules and regulations for safe boating contained in a pamphlet, "Federal Requirements for Recreational Boats," available from your local U.S. Coast Guard Director or Auxiliary or State Boating Official (U.S. Coast Guard, 1987).

3.2.6 Prior to a sampling trip, personnel should determine that all necessary equipment is in safe working condition and that the operators are properly

trained to use the equipment.

3.2.7 Safety equipment and first aid supplies should be available in the laboratory and in the field at all times. A snake bite kit should be carried on all field trips in areas that may be infested with poisonous snakes. All motor vehicles and boats with motors should have fire extinguishers.

3.3 Safety Equipment and Facilities

3.3.1 Necessary and appropriate safety apparel such as waders, lab coats, gloves, safety glasses, and hard hats should be available.

3.3.2 First aid kits, fire extinguishers and blankets, safety showers, and emergency spill kits should be readily available in the laboratory at all times.

3.3.3 A properly installed and operating hood should be provided in the laboratory for use when working with volatile chemicals that may produce dangerous fumes.

3.3.4 Communication equipment should be available to field personnel and those working in mobile labs in remote areas for use in case of an emergency.

3.3.5 Facilities and supplies should be available for cleaning of exposed body parts that may have been contaminated by pollutants in the water. Soap and an adequate supply of clean water or ethyl alcohol may be suitable for this purpose.

3.4 Field and Laboratory Operations

3.4.1 At least two persons should be involved in all field collecting trips and no one should be left alone while in the field.

3.4.2 All surface waters should be considered potential health hazards due to toxic substances or pathogens and exposure to them should be minimized as much as possible. Exposed body parts should be cleaned immediately after contact with these waters.

3.4.3 All electrical equipment should bear the approval of Underwriters Laboratories and be properly grounded to protect against electric shock.

3.4.4 Staff training in basic first aid and cardio-pulmonary resuscitation is strongly recommended.

3.4.5 Before transporting grab sampling devices, be sure all safety lock pins are in place or transport them in the closed position. Read and follow all safety instructions provided by the manufacturer.

3.4.6 Use a winch for retrieving samples collected with heavy sampling devices such as the Ponar grab and use care in lifting heavy items to prevent back injury.

3.4.7 Heavy gloves should be used when hands are used to agitate the substrate

during collection of square-foot type samples and when turning over rocks during hand picking.

3.4.8 Persons working in areas where poisonous snakes may be encountered should check with the local Drug and Poison Control Center for recommendations on what should be done in case of a bite from a poisonous snake. If local advice is not available and medical assistance is over an hour away, carry a snake bite kit and be familiar with its use. Any person allergic to bee stings or other insect bites should take proper precautions and have any needed medications handy.

3.4.9 Personnel dealing in field activities on a regular or infrequent basis should be in sound physical condition and have a physical exam annually in accordance with Regional or State Safety Officer's requirements.

3.4.10 Hypothermia--all field personnel should be familiar with the symptoms of hypothermia and know what to do in case symptoms should occur. Hypothermia can kill a person at temperature much above freezing (up to 50°F) if he or she is exposed to wind and rain or otherwise becomes wet.

3.5 Disease Prevention

3.5.1 Because it is not known what pollutants may be present in surface waters and sediments, they should be considered potential health hazards and exposure to them kept to a minimum.

3.5.2 Personnel, who may be exposed to water known or suspected to contain human wastes, should be immunized against tetanus, hepatitis, typhoid fever, and polio.

3.6 Literature Cited

US Coast Guard. 1987. Federal requirements for recreational boats. U.S. Department of Transportation, United States Coast Guard, Washington, DC 20593.

USEPA. 1986. Occupational health and safety manual. Office of Planning and Management, U.S. Environmental Protection Agency, Washington, DC 20460.